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DETAILS OF THE ANODE-MECHANICAL SAW

Kh. M. Sarbash

/Schematic drawing and graph are appended./

The anode-mechanical saw built by the author employs the standard mechanisms of a lathe or turret lathe. The electrolyte is pumped to the cutting point at the rate of 25 meters per minute. The pump is mounted on the top of the electrolyte tank. The tank should be designed to hold 75-100 liters of fluid. In order that none of the electrolyte be lost, the disk of the saw is enclosed in a casing. A hopper and pan are installed on the feed table of the lathe on the same side as the saw.

The table feed is performed by a 1.3-kilowatt alternating current motor. A 25 to 30-volt, 250 to 300-ampere, direct-current generator feeds current into the cutting disk through a contact ring and brush arrangement. All controls of the unit are in a central switchboard. An overload relay has been included in the alternating current electrical system to prevent possible breakdown in the event of an unexpected break in the flow of electrolyte or an unforeseen load increase.

It is possible to use 25-30-volt alternating current for anode-mechanical cutting. An ST-2 welding machine transformer has been used for this purpose.

Specifications of the saw built by the author are as follows: swing of lathe, 200 millimeters; total length of bed, 2,250 millimeters; width of bed, 300 millimeters; length of cut, 750 millimeters (varies with length of lathe bed used); capacity of saw motor, 0.8 kilowatts; diameter of saw, 500-600 millimeters (made of 1.5-2 mm sheet steel); saw shaft diameter, 50 millimeters shaft length, 1,010 millimeters.

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The advantages of fixed mechanical feed in the anode-mechanical cutting process are: (a) the wide range of variations and adjustment of feed depending on the thickness and properties of the material to be cut and (b) the high degree of standardization in the cutting process.

Economically, the anode-mechanical process of cutting steel completely justifies itself. The graph appended shows the time required for cutting one linear meter of steel by various methods before the introduction of anode-mechanical cutting at the plant. Curves 5 and 6 show, respectively, the tentative cutting norms established during the first months of operation at the plant, and the planned norm for future operation.

Included in the time shown for all methods are the preparation and finishing time, the time required for secondary operations, cutting time, and the time for marking and sorting blanks.

Curves 1, 2, and 3 indicate work done with high-speed steel bits; the material being cut is steel 7-8.

The saw blade itself is made of ordinary steel (grade 2 or 3), dressed on the outer edge. Five to seven blades are required per month.

On the principle of the above-described saw, it would be fully possible to design a portable all-purpose saw for cutting materials of any shape or size.

The following rates of feed are recommended for the thickness indicated:

Thickness of Sheet Steel (mm)	Feed (mm per min)
10	30
15	26
20	23
25	21
30	19
40	16
50	13
60	11
80	9
100	8
125	7
150	6

Current intensities recommended for various thicknesses of steel sheet are as follows:

Thickness of Sheet (mm)	Voltage	Amperage
20-30	24-25	100-225
30-60	23-25	125-250
60-100	22-24	150-275
100-150	21-22	200-300
150-200	--	250-350

[Schematic drawing and graph follow]

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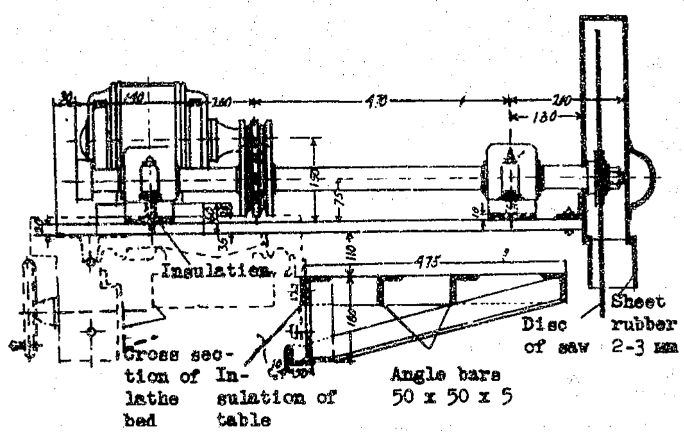
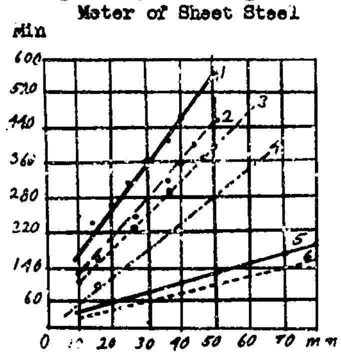


Time Required for Cutting One Linear Meter of Sheet Steel



Thickness of Sheet

1 Drilling, 6-mm diameter bit, 2 Drilling, 8-mm bit,
3 Drilling, 10-mm bit; 4 Electric-arc cutting,
5 Cutting by anode-mechanical method (tentative norms),
6 Planned norms for anode-mechanical saw.

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